STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

December 12, 1986

Federal Express
(2128707361)

Mr. John W. Rains
Chief Mining Engineer
CalMat
California Portland Cement Division
695 South Rancho Avenue
Colton, California 92324-0514

Dear Mr. Rains:

Re: Final Permit Approval, California Portland Cement, Hidden Valley Mine, INA/015/007, Folder #2 and 4, Emery County, Utah

Enclosed is the final state permit approval for the Hidden Valley Mine. Appended to the actual permit is the Technical Analysis (TA) and supporting documentation. Please examine the TA and associated stipulations and sign both copies of the attached permit, INA/015/007, 12/86, on page 5 of that document. Please keep one signed copy of the permit for your records and return one original via Certified Return Receipt Requested to the Division at your earliest convenience.

A signed and executed performance bond in the amount of $171,515.00 for the Hidden Valley Mine payable to the Division of Oil, Gas and Mining must be posted before the permit will become valid and enforceable.

Thank you for your cooperation in this matter. Should you have any questions, please feel free to contact the Division.

Best regards,

Dianne

Dianne R. Nielson
Director

JJW/djh
Enclosure(s)
cc: A. Klein
R. Hagen
J. Jarvis
L. Braxton
Tech Review Team A
9294R/48

FINDINGS DOCUMENT

Calmat Company
Hidden Valley Coal Company
Hidden Valley Mine
INA/015/007, Emery County, Utah

December 8, 1986

1. The plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act (the "Act"), and the approved Utah State Program have been complied with (UMC 786.19(a)).

2. The applicant proposes acceptable practices for the reclamation of disturbed lands. These practices have been shown to be effective in the short-term; there are no long-term reclamation records utilizing native species in the western United States. Nevertheless, the regulatory authority has determined that reclamation, as required by the Act, can be feasibly accomplished under the Mining and Reclamation Plan (MRP) (UMC 786.19(b)). (See Technical Analysis (TA), Section UMC 817.21-.25 and 817.111-.117.)

3. The assessment of the probable cumulative impacts of all anticipated coal mining activities in the general area on the hydrologic balance has been made by the regulatory authority. The reclamation plan proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area (UMC 786.19(c) and UCA 40-10-11(2)(c)). (See Cumulative Hydrologic Impact Analysis (CHIA) Section, attached to this Findings Document.)

4. The proposed permit area is:

   A. not included within an area designated unsuitable for underground coal mining operations;

   B. not within an area under study for designated lands unsuitable for underground coal mining operations;

   C. not on any lands subject to the prohibitions or limitations of 30 CFR 761.11(a) (national parks, etc.), 761.11(f) (public buildings, etc.) and 761.11(g) (cemeteries);

   D. not within 100 feet of the outside right-of-way line of a public road (UMC 761.11);

   E. not within 300 feet of any occupied dwelling (UMC 786.19(d)). (See MRP Section 782.16.).

5. The regulatory authority's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19(e)). (See attached letter from State Historic Preservation Officer (SHPO) dated July 10, 1986.)

6. The applicant has the legal right to enter and complete reclamation activities in the permit area through a fee coal and surface agreement (UMC 786.19(f)).

7. The applicant has shown that prior violations of applicable laws and regulations have been corrected (UMC 785.19(g)). (Memo of November 7, 1986 from Joe Helfrich, Division of Oil, Gas and Mining (DOGM), Inspection and Enforcement section.)

8. Neither Hidden Valley Coal Company nor its parent company, Calmat, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund (it has no active operations) (UMC 786.19(h)) (personal communication, Valerie Coleman, OSM, Washington, D. C., November 21, 1986).

9. The applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19(i)) (personal communication, Valerie Coleman, OSM, Washington, D. C., November 21, 1986).

10. Underground coal mining and reclamation operations to be performed under the permit will not be inconsistent with other operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19(j)).

11. A detailed analysis of the proposed bond has been made. The bond estimate is $171,515.00 in 1987 dollars. The regulatory authority has made appropriate adjustments to reflect costs which would be incurred by the state, if it was required to contract the final reclamation activities for the mine site. The bond shall be posted (UMC 786.19(k)) with the regulatory authority prior to final permit issuance.

12. No lands designated as prime farmlands or alluvial valley floors occur on the permit area (UMC 786.19(l)).

13. The proposed postmining land-use of the permit area has been approved by the regulatory authority (UMC 786.19(n)). (See TA, Section UMC 817.133.)

14. The regulatory authority has made all specific approvals required by the Act, and the approved State Program (UMC 786.19(n)).

15. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats (UMC 785.19(o)).

16. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.11-.15).

Prior to the permit taking effect, the applicant must agree to comply with the special stipulations in the permit and post the performance bond for reclamation activities.

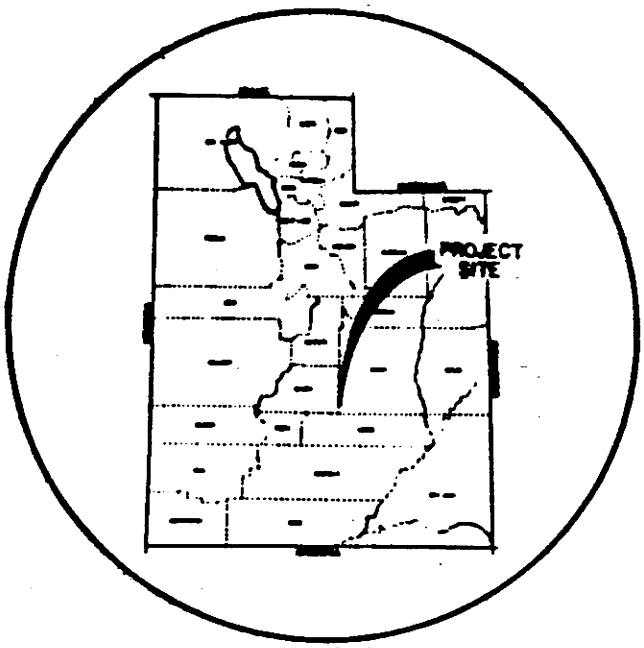
John J W Hitchcock
DOGM Lead Reviewer

Samuel P Brayton
Administrator, Mineral Resource
Development and Reclamation Program

Kenneth E. May
Associate Director, Mining

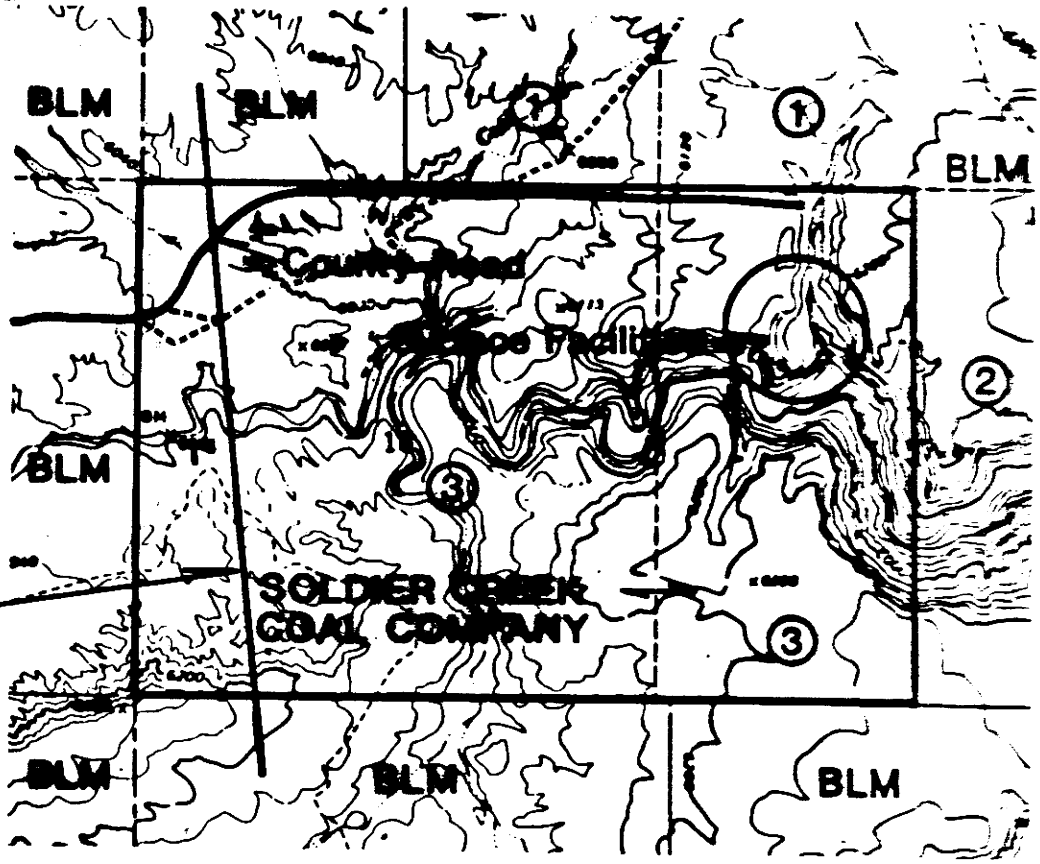
Dianne R. Nielson
Director

0920R/37



HIDDEN VALLEY MINE SITE

Township 23 South, Range 6 East
Salt Lake Base and Meridian
Section 18 & the West 1/2 of Section 17



1. CONSOLIDATED COAL - 50% SURFACE AND MINERAL
   THE PITTSBURG MIDWAY - 50% SURFACE AND MINERAL
   GULF OIL CORP. - 50% COAL
2. BANK OF CALIFORNIA (LOVELLA COOK ROYALTY CONVEYANCE)
   JOHN E. LANSING
3. IVIE CREEK COAL ASSOCIATES - 100% MINERALS

br CONSULTANTS GROUP
SALT LAKE CITY, UTAH

SOLDIER CREEK COAL COMPANY
HIDDEN VALLEY MINE

HIDDEN VALLEY MINE
OWNERSHIP

1" = 2000'

PLATE II-A

Mine File
L. White Mine

RECEIVED
JUL 17 1986

DIVISION OF
OIL, GAS & MINING

NORMAN H. BANGERTER
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND
ECONOMIC DEVELOPMENT

Division of
State History
(UTAH STATE HISTORICAL SOCIETY)

MELVIN T. SMITH, DIRECTOR
300 RIO GRANDE
SALT LAKE CITY, UTAH 84101-1182
TELEPHONE 801 533-5755

July 10, 1986

Lowell P. Braxton
Administrator
State of Utah Natural Resources
Oil, Gas, and Mining
355 W. North Temple
3 Triad Center Suite 350
Salt Lake City, Utah 84180

RE: Reclamation Project, Hidden Valley Mine, California Portland Cement Company, INA/015/077, Emery County, Utah

In Reply Please Refer To Case No. J054

Dear Mr. Braxton:

The Utah Preservation Office has received the above referenced Hidden Valley Mine Reclamation Project for consideration. After review our office has the following comment.

No mention is made in the report of cultural resources in the project area prior to mining or at present. However, it appears that the reclamation will affect already highly disturbed land, and cultural resources with integrity and over fifty years of age are unlikely to be present.

The above is provided on request as assistance as outlined by 36 CFR 800.5, or Utah Code, Title 63-18-37. If you have questions or need additional assistance, please let us know. Contact me or Charles Shepherd at 533-7039.

Sincerely,

James L. Dykman
Acting Preservation Development Coordinator

LAD:jrc:J054/3149V

NON-FEDERAL
(February 1985)

Permit Number INA/015/007, 12/86

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340

This permit, INA/015/007, 12/86, is issued for the State of Utah by the Utah Division of Oil, Gas and Mining(DOGM) to:

California Portland Cement Company
Hidden Valley Coal Company
P. O. Box 2950
Los Angeles, California 90051

for the Hidden Valley Mine. Hidden Valley Coal Company is the lessee/owner of certain fee-owned parcels. The permit is not valid until a performance bond is filed with the Division of Oil, Gas and Mining in the amount of $171,515.00, payable to the state of Utah, Division of Oil, Gas and Mining, and the DOGM has received a copy of this permit signed and dated by the permittee.

Sec. 1 STATUTES AND REGULATIONS - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as UCMRA.

Sec. 2 The permittee is authorized to conduct surface coal mining and reclamation operations on the following described lands (as shown on ownership map) within the permit area at the Hidden Valley Mine situated in the state of Utah, Emery County, and located:

Township 23 South, Range 6 East (SLBM)
Section 18 and West 1/2 Section 17.

_____

_____

_____

_____

This legal description is for the permit boundary (as shown on the permit area map) of the Hidden Valley Mine. The permittee is authorized to conduct surface and reclamation operations connected with mining on the foregoing described property subject to the conditions of the leases, the approved mining plan, including all conditions and all other applicable conditions, laws and regulations.

Sec. 3 This permit is issued for a term of five (5) years commencing on the date the permit is signed by the permittee, except that this permit will terminate if the permittee has not begun the surface coal mining and reclamation operations covered herein within three (3) years of the date of issuance.

Sec. 4 The permit rights may not be transferred, assigned or sold without the approval of the Director, DOGM. Request for transfer, assignment or sale of permit rights must be done in accordance with applicable regulations including but not limited to UMC 788.17-.19.

Sec. 5 The permittee shall allow the authorized representative of the DOGM, including but not limited to inspectors, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:

A. have the rights of entry provided for in UMC 840.12, and UMC 842.13; and

B. be accompanied by private persons for the purpose of conducting an inspection in accordance with UMC 842.12, when the inspection is in response to an alleged violation reported by the private person.

Sec. 6 The permittee shall conduct surface coal mining and reclamation operations only on those lands specifically designated as within the permit area on the maps submitted in the mining plan and permit application and approved for the term of the permit and which are subject to the performance bond.

Sec. 7 The permittee shall minimize any adverse impact to the environment or public health and safety resulting from non-compliance, including but not limited to:

A. accelerated monitoring to determine the nature and extent of non-compliance and the results of the non-compliance;

B. immediate implementation of measures necessary to comply; and

C. warning, as soon as possible after learning of such non-compliance, any person whose health and safety is in imminent danger due to the non-compliance.

Sec. 8 The permittee shall dispose of solids, sludge, filter backwash or pollutants in the course of treatment or control of waters or emissions to the air in the manner required by the approved Utah State Program which prevents violation of any applicable State law.

Sec.9 The lessee shall conduct its operations:

A. in accordance with the terms of the permit to prevent significant, imminent environmental harm to the health and safety of the public; and

B. utilizing methods specified as conditions of the permit by DOGM in approving alternative methods of compliance with the performance standards of the Act and the approved Utah State Program.

Sec. 10 The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.

Sec. 11 The permittee shall comply with the provisions of UCA 26-11-1 et seq (Water Pollution Control) and UCA 26-13-1 et seq (Clean Air

Sec. 12 Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit in accordance with the Act and the approved Utah State Program.

Sec. 13 If during the course of mining operations, previously unidentified cultural resources are discovered, the applicant shall ensure that the site(s) is (are) not disturbed and shall notify the State Regulatory Authority (RA). The state RA shall inform the operator of necessary actions required.

Sec. 14 APPEALS - The lessee shall have the right to appeal Division actions as provided under UMC 787.

Sec. 15 SPECIAL CONDITIONS - In addition to the general obligations and of performance set out in the leases, and this permit, the permittee shall comply with the special conditions appended hereto as Attachment A.

The above conditions (Secs. 1-15) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of the grantor and the permittee at any time to adjust to changed conditions or to correct an oversight. The grantor may amend these conditions at any time without the consent of the permittee in order to make them consistent with any new federal or state statutes and any new regulations.

THE STATE OF UTAH

By: Dianne R. Nielson

Date: December 12, 1996

I certify that I have read and understand the requirements of this permit and any special conditions attached (see Attachment A).

_____

Authorized Representative of
the Permittee

Date: _____

APPROVED AS TO FORM:

BY: Barbara W Roberts
Assistant Attorney General

Date: December 11, 1986

0920R/25

ATTACHMENT "A"

Stipulation 817.13-15 (1)-JW

Within 30 days of permit approval, the applicant must commit to plug and abandon the drill holes #1, 2, 3 and 7, according to the procedures described in the Utah Division of Water Rights' Administrative Rules for Water Well Drillers upon abandonment of the wells unless these holes are transferred according to the requirements of UMC 817.53.

Stipulation 817.101-(1)-PGL

The sideslopes of the sediment pond shall be reduced to at least a 3h:1v slope during final reclamation and recontouring of the pond area.

0920R/42

HIDDEN VALLEY CHIA

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT
CALMAT
HIDDEN VALLEY MINE
INA/015/007
EMERY COUNTY, UTAH

December 8, 1986

I. INTRODUCTION

The purpose of this report is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for Calmat's Hidden Valley Mine located in Emery County, Utah (Figure 1). The assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and whether the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area. This report complies with federal legislation passed under the Surface Mining Control and Reclamation Act (SMCRA) and subsequent Utah and federal regulatory programs under UMC 786.19(c) and 30 CFR 784.14(f), respectively.

Calmat's Hidden Valley Mine is located approximately seven miles southwest of Emery, Utah in Section 17 and 18, Township 23 South, Range 6 East (Figure 1). The mine is located in the Emery Coal Field 35 miles east of Salina, 70 miles south of Price in Sevier and Emery counties. The effective width of the Emery Coal Field is from 4-8 miles and a length of about 35 miles (Doelling, 1972). Elevations in the Emery Coal field vary from 6,000 feet to over 8,000 feet.

Outcropping rocks of the Emery Coal Field range in age from Lower Cretaceous to Quaternary in age. The rock record reflects oscillating transgressive and regressive sequences that include, in ascending order, fluvial through littoral (Dakota Sandstone), marine (Tununk Shale), fluvial and lagoonal (Ferron Sandstone) and marine (Blue Gate Shale, Emery Sandstone, Masuk Shale) depositional environments. Uncomformably overlying Cretaceous sedimentary rocks are Tertiary volcanics and Quaternary deposits. The major coal-bearing unit in the Emery Coal Field is the Ferron Sandstone.

Annual precipitation varies from 30 inches in the Upper Ivie Creek drainage to slightly more than 7 inches per year at the minesite. The area around the minesite could be considered a semi-arid to arid climate regime.

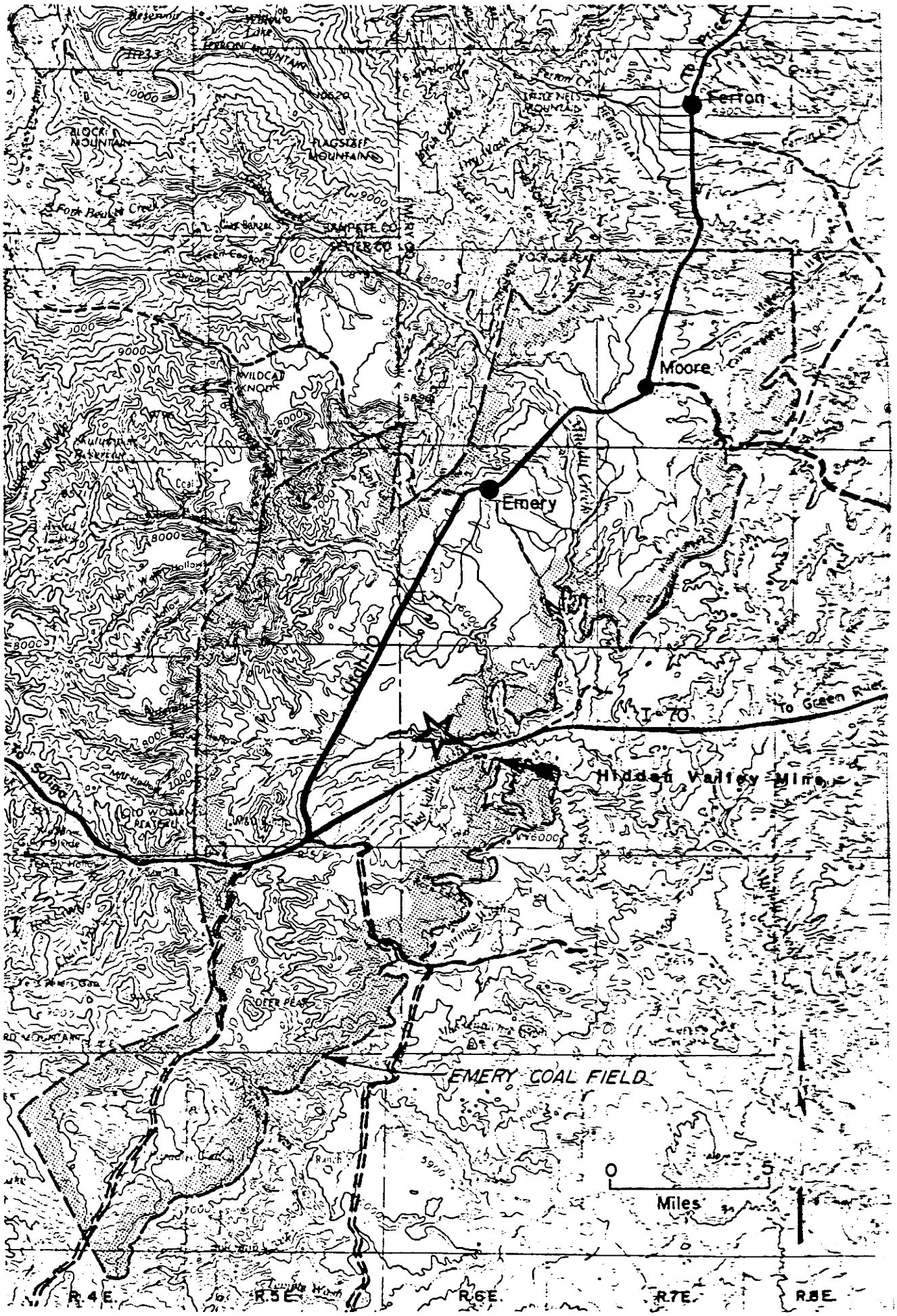


Figure 1. Emery Coal Field

Vegetative types found within the vicinity of the Emery Coal Field area are part of the Desert Shrub and Pinyon-Juniper plant associations. The desert shrub association occurs on the lower benches and valley bottoms. The Pinyon-Juniper plant association occurs on the higher benches and upper slopes where the soils are more sandy and better drained.

The Emery Deep Mine and proposed Emery Surface Mine are located along Quitchapah Creek approximately 2.5 miles north of the Hidden Valley Mine. The J. B. King Mine located approximately 2.5 miles south of the Hidden Valley Mine has been reclaimed. The active, proposed and reclaimed mines are all sited within the Emery Coal Field. Permitting actions have derived Cumulative Hydrologic Impact Assessments (CHIAs) for the Emery Deep Mine and the J. B. King Mine. CHIA findings for the J. B. King Mine indicate minimal mining-induced impacts to surface and ground-water resources (J.B.. King Mine CHIA), whereas those for the Emery Deep Mine suggest increased salt loading to Quitchapah Creek and decreased ground- water levels in the Ferron Sandstone aquifer (Emery Deep Mine CHIA).

II. CUMULATIVE IMPACT AREA (CIA)

Figure 2 delineates the CIA for the Hidden Valley Mine. The CIA includes the SE 1/4 of Section 12, E 1/2 of Section 13, and NW 1/4 of Section 24, Township 23 South, Range 5 East and the S 1/2 of Section 7, S 1/2 of Section 8, N 1/2 of Section 19, N 1/2 of Section 20, Section 18 and Section 17, Township 23 South, Range 6E. The CIA encompasses 3,200 acres.

III. SCOPE OF MINING

Development mining within the study area began on April 17, 1980 following approval under the Interim Program Regulations.

The permit area encompasses 910 acres. Development mining occurred in the A and C/D seams of the Ferron Sandstone and consisted of two exploratory adits driven total lengths of approximately 240 feet (C/D seam) and 260 feet (A seam). Total underground development was less than 1/4 acre.

Surface disturbance encompassed approximately 7.0 acres and consisted of constructing and installing a road, pads and drainage control structures.

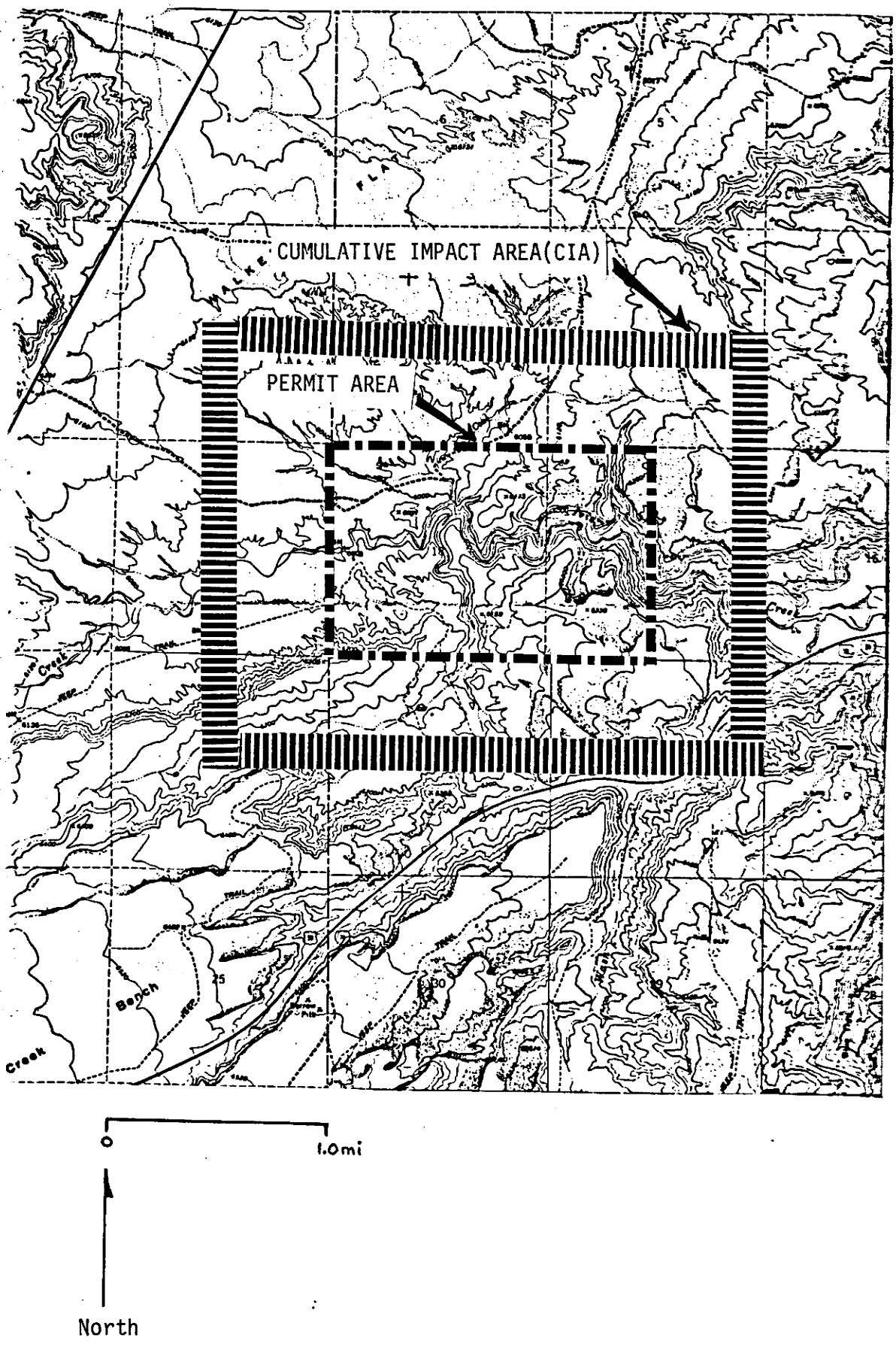


Figure 2. Cumulative Impact Area (CIA).

IV. STUDY AREA

A. Geology

Stratigraphic units outcropping within the study area include, from oldest to youngest, the Tununk Shale, Ferron Sandstone, Blue Gate Shale and Quaternary deposits. Lithologic descriptions and unit thicknesses are given in Figure 3.

System	Series	Stratigraphic Unit	Thickness (feet)	Description
Quaternary	Holocene Pleistocene	Quaternary Deposits	Variable	Surficial stream terrace and alluvial fan deposits.
	Coniacian	Blue Gate Shale Member	1,600	Pale blue-gray, nodular and irregularly bedded marine mudstone and silt-stone.
Upper Cretaceous	Turonian	Ferron Sandstone Member (major coal seams)	400-500	Alternating yellow-gray sandstone, sandy shale and gray shale with important coal beds of Emery Coal Field.
	Cenomanian	Tununk Shale Member	600-700	Blue-gray to black sandy marine mudstone.

Figure 3. Stratigraphy of the Hidden Valley Mine Area (modified from Doelling 1972).

Rocks in the study area strike generally north and dip one to two degrees to the west. Principal coal accumulations occur within the Ferron Sandstone Member of the Mancos Shale. Two coal seams with economic potential have been identified and are termed, in ascending order, the Ferron "A" and "C/D" seams.

B. Topography and Precipitation

Topography ranges from less than 5800 feet to over 6400 feet in the CIA.

The study area is characterized by an easterly system of small exphemeral drainages.

Average annual precipitation is approximately 7 inches. The CIA may be classified as semi-arid.

C. Vegetation

The majority of vegetation of the CIA can be classified within Desert Shrub and Pinyon-Juniper Vegetation Associations. Desert Shrub types occupying lower benches, valley bottoms and rocky cliffs include Shadscale - Galleta grass, Shadscale - Indian ricegrass - Drop seed, Mat saltbush - Indian ricegrass, and Greasewood - Saltgrass. Pinyon and Juniper woodlands occupy higher benches and upper slopes. Understory vegetation of the woodlands include either Sagebrush species and Galleta grass or Mixed Mountain Shrub species.

Riparian vegetation is limited to narrow ribbons of dense vegetation along both perennial and intermittent creeks. Common plants include Greasewood, Reed canary grass, Saltgrass, Rabbitbrush and Tamarisk.

V. HYDROLOGIC RESOURCES

A. Ground Water

The ground-water regime within the CIA is dependent upon climatic and geologic parameters that establish systems of recharge, movement and discharge.

Springs do not occur within and adjacent to the CIA. Exploration drilling (4 boreholes) within the permit area encountered subsurface water in the Ferron Sandstone. Three of the boreholes, located in the western portion of the permit area, encountered artesian conditions. Wells drilled to similar depths in the eastern portion of the permit area were dry. All boreholes were plugged and abandoned in compliance with Chapter I of the Coal Mining and Reclamation Permanent Program.

Morrissey, Lines and Bartholoma (1980) identified the Ferron Sandstone aquifer as a regional ground-water resource of the Emery Coal Field and concluded that recharge to the Ferron Sandstone aquifer occurs mainly as subsurface inflow from the Wasatch Plateau. Moreover, natural discharge occurs to alluvium along streams, leakage to the

underlying Tununk Shale, upward leakage to the Blue Gate Shale and negligible discharge by seeps and springs (Morrissey, Lines and Bartholoma, 1980).

Data derived by the operator indicate water quality of the Ferron Sandstone aquifer is characterized by elevated sulfate, bicarbonate and sodium values.

B. Surface Water

The Hidden Valley Mine site is located within a 1590 square mile area which forms the Muddy Creek drainage basin. The largest stream in the area is Muddy Creek, with Quitchupah and Ivie Creek being the only other streams of significant size. Muddy Creek flows southwest and converges with the Fremont River which then forms the Dirty Devil River. The Dirty Devil River converges with the Colorado River in southeastern Utah. The total drainage area for Ivie Creek is about 131 square miles, or 8.2 percent of the Muddy Creek Drainage Area. The average land slope is 21 percent.

VI. POTENTIAL HYDROLOGIC IMPACTS

A. Ground Water

The only recognizable ground-water resource within the CIA is the Ferron Sandstone aquifer. Development mining, of less than 1/4 acre, did not intercept the ground-water resource. Accordingly, a mining or reclamation induced dewatering impact is determined to have a low probability.

Mining development consisted of two exploratory adits approximately 20 feet wide and 250 feet long. Potential subsidence encompasses less than 1/4 acre at the surface and will not occur within the aquifer recharge area. Accordingly, ground-water impacts related to mining-induced subsidence are determined to be negligible.

B. Surface Water

No material damage to surface water has occurred because of the limited development at the Hidden Valley Mine. Sediment control is currently in place and will remain in place until the reclamation bond is released. Any sediment loading associated with reclamation of minor ephemeral channels will be minimal or non-existent due to the use of alternative sediment controls and riprap protection in the channels.

No material damage is expected to occur during reclamation due to the operator's use of silt fences to trap and treat any runoff waters from disturbed areas adjacent to reclaimed channels. Other water

quality parameters have not been considered due to the nature of the disturbance and its anticipated impact. Accordingly, the surface water impacts associated with reclamation are determined to be negligible.

CONCLUSIONS

Mining in the Wasatch Plateau Coal Field is considered sufficiently removed hydrologically that it will not adversely impact water resources in the Emery Coal Field area. Hydrologic impacts associated with J. B. King Mine have been determined to be minimal. An assessment of hydrologic impacts related to the Emery Deep Mine and proposed Emery Surface Mine indicates an increase in salt loading and decrease in ground-water levels.

Hydrologic impacts associated with the Hidden Valley Mine will contribute negligibly to the impacts identified for the Emery Deep Mine and proposed Emery Surface Mine. Accordingly, it is herein determined that the reclamation plan for the Hidden Valley Mine is consistent with preventing damage to the hydrologic balance outside the permit area.

REFERENCES

Utah Division of Oil, Gas and Mining, 1985, J. B. King Mine: Cumulative Hydrologic Impact Assessment, Final Technical Analysis, 10p.

Doelling, H. H., 1972. Central Utah coal fields: Sevier-Sanpete, Wasatch, Plateau, Book Cliffs and Emery: Utah Geological and Mineral Survey, Monograph Ser. No. 3.

Morrissey, D. J., Lines, G. C., and Bartholoma, S. D., 1980, Three-dimensional digital-computer model of the Ferron Sandstone aquifer near Emery, Utah: U. S. Geological Survey, Water Resources Invest. 80-62, 101p.

Office of Surface Mining, 1985, Emery Deep Mine: Cumulative Hydrologic Impact Assessment, Final Technical Analysis, 11p.

TECHNICAL ANALYSIS

California Portland Cement
Hidden Valley Coal Company
Hidden Valley Mine
INA/015/007, Emery County, Utah

December 8, 1986

UMC 785.19 Alluvial Valley Floors (JW)

The pad areas to be reclaimed which are adjacent to Ivie Creek, a perennial stream, encompasses less than 4 acres. No historical record of attempts to farm in this area exist, probably due to the extremely limited area.

Since the proposed reclamation operation does not include the extraction of coal nor significant physical disturbance of the surface or groundwater regime, and since the area would provide negligible support to agricultural production, the requirements of UMC 785.19 (d) and (e) are not applicable and are hereby waived.

UMC 817.13-15 Casing and Sealing (PGL/JW)

Applicant's Proposal

There are four shallow exploration adits in the Hidden Valley Mine permit area (page 13). Incombustible material will be backfilled into each adit at least 25 feet. There are seven exploration drill holes associated with the Hidden Valley Mine. Four of these holes encountered artesian flow, were cased and completed as water wells. Valves were installed, wrapped with insulation, covered and buried. An inspection on July 31, 1986 determined that there has been no leaking from the four flowing holes. The water rights for these four holes (drill holes #1, 2, 3 and 7) have been extended through January 31, 1988 (shown in plan as an attachment) by the Division of Water Rights.

There are three dry exploration holes. Drill hole #4 was not found. Drill hole #5 will be plugged with a five-foot surface plug and drill hole #6 was found to be cemented to the surface with a survey marker installed in the plug.

Compliance

The applicant's proposal to backfill the exploration adits with at least 25 feet of incombustible material is

acceptable, because the adits are shallow and undeveloped. Therefore, the requirements for block seals have been waived in this case.

The dry drill holes will be plugged with five feet of surface cement. The fourth drill hole will be located at the time of reclamation, if possible, and will be plugged with five feet of surface cement (page 16a, PAP).

Drill holes #1, 2, 3 and 7 are part of Hidden Valley Coal Company's water rights that have been extended until January 31, 1988. If the water rights are terminated, then abandonment procedures as required by the Utah Division of Water Rights Administrative Rules for Water Well Drillers will be undertaken within 90 days of the date of final notice on the water right. If the water rights are transferred, Hidden Valley Coal Company will follow the procedures in 817.53 for transfer of water rights (page 16-a, PAP).

The applicant will comply when the following stipulation is met.

Stipulation 817.13-15 (1)-JW

Within 30 days of permit approval, the applicant must commit to plug and abandon the drill holes #1, 2, 3 and 7, according to the procedures described in the Utah Division of Water Rights' Administrative Rules for Water Well Drillers upon abandonment of the wells unless these holes are transferred according to the requirements of UMC 817.53.

UMC 817.21 Topsoil: General Requirements (DD)

Existing Environment and Applicant's Proposal

One topsoil stockpile exists on the "B" seam pad. The stockpile consists of approximately 770 cubic yards, the material is a sandy loam with a calculated Ec of 2.43 and a SAR of 1.8.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.22-817.23 Topsoil: Removal and Storage (DD)

Existing Environment and Applicant's Proposal

The applicant does not propose to disturb any additional acreage, therefore no topsoil will be removed and stored. These sections are not applicable.

UMC 817.24 Topsoil: Redistribution

Existing Environment and Applicant's Proposal

The existing topsoil stockpile will be redistributed over the 2.1 acres of the "B" seam pad, at an approximately depth of 2.5 inches. Samples of the lower and upper "B" seam pad materials have calculated Ec values of 3.67 and 4.42 mmhos/cm^3 and SAR values of 3.41 and 2.32 respectively.

The applicant states that the "A" seam pad and sediment pond were constructed of alluvial silt loams, rocky sandy loams and coal seam overburden material. There is no topsoil available for this pad so the existing mixture of materials will be used for the seed bed. The applicant also commits to salvaging the better soil materials as they are exposed during reclamation (page 53, MRP). A sample from the "A" seam pad had a calculated Ec of 4.15 and an SAR of 5.75.

Compliance

The proposed topsoil redistribution plan is in compliance with this section. The topsoil that was salvaged and that will be redistributed over the "B" seam pad will only cover the pad with approximately 2.5 inches. The sample analysis of the "B" seam pad material, which will be within the root zone of all plants, indicates that the material should not be limiting to plant growth, considering the species proposed for revegetation. The analysis of the "A" seam pad material also indicates that the material is a suitable plant growth medium, again considering the revegetation species proposed for the site.

Stipulations

None.

UMC 817.25 Topsoil: Nutrients and Soil Amendments

Existing Environment and Applicant's Proposal

The soil and pad materials are low in fertility; they lack sufficient cation exchange capacity and organic matter to provide the basic nutrients for plant growth. Phosphorous contents are especially low. Soil textures are sandy loams with saturation percentages at expected values for the sandy nature of these soils. However, the material should hold adequate water.

The applicant proposes to overcome the poor fertility and low organic matter contents of the soils by applying green alfalfa hay mulch at a rate of 4000 lbs./acre. Diammonium phosphate fertilizer will also be spread in the fall at the rate of 242 lbs./acre. This is equivalent to 48 pounds of N and 130 pounds of P_2O_4 per acre. The mulch and fertilizer will be covered by dragging operations. In the spring, 100 pounds of liquid urea will be applied per acre, which is equivalent to 46 pounds of N per acre. This spring application of urea is to compensate for increased soil microbial activity due to organic matter decomposition. The alfalfa hay mulch will supply approximately 96 pounds of N, 18 pounds of P_2O_5 and 81 pounds of K_2O per acre upon decomposition.

Compliance

Considering the precipitation regime and plant communities in the vicinity, the fertilization program appears somewhat excessive. The project consultant, however, has used similar reclamation plans on other comparable sites with excellent results.

The applicant is in compliance with the above section and the proposed fertilization plan is approved. The following alternative recommendations are also acceptable to the Division.

(1) Diammonium phosphate is much more expensive than Ammonium phosphate with an analysis of (16-20-0). Ammonium phosphate is much more readily available. Ammonium phosphate (16-20-0) at the proposed rate of 242 lbs./acre would also supply 48 lbs./acre of P_2O_5, which is recommended by Utah State University for soils with similar phosphorous contents.

(2) Lowering the proposed rate of 242 lbs/acre of Diammonium phosphorous to 100 lbs./acre would also lower the P_2O_5 application rate to 54 lbs/acre, which is more in line with state recommendations and would be less costly.

Stipulations

None.

817.41-42 Hydrologic Balance (TM)

Applicant's Proposal

The applicant has proposed to monitor flow in Ivie Creek on a semi-annual basis according to the requirements of the post-mining monitoring guidelines (page 62-63, PAP). The location and description of these monitoring points is given on page 62A of the PAP. Water quality samples will also be secured at the discharge points from the reclaimed area to Ivie Creek during each runoff event encountered during scheduled monitoring visits (water quality and revegetation checks).

The channels existing previous to mining will be reconstructed and sediment control will be supplied during the reclamation bonding period. No reclamation activities will be conducted in the buffer zone except for the removal of culverts that empty into the creek and the subsequent restoration of channels (page 64, PAP).

Compliance

The applicant complies with the requirements of these sections. The applicant proposes to reclaim all culverted or disturbed ephemeral channels within the permit area to meet design specifications of UMC 817.44. All sediment pond control structures (i.e., sediment pond) will be removed during reclamation and replaced with berms and silt fences to adequately control sediment during the reclamation pond period until the site has become stabilized. The road leading into the site will be reclaimed and waterbarred to minimize erosion and water pollution (see 817.160-166). All reclaimed channels, exhibiting excessive velocities, will be riprapped in the appropriate sections to minimize water pollution. Through the use of alternative sediment controls, the applicant has demonstrated that he will meet all applicable state and federal effluent limitation standards.

Stipulations

None.

UMC 817.43-45 Hydrologic Balance: Stream Channel Diversions (TM)

Applicant's Proposal

The specifics of stream channel reclamation are spelled out by the applicant on pages 28-34 of the PAP. The 250 feet of 48-inch diameter culvert in the B seam pad will be removed and the ephemeral channel restored to an approximately natural grade. The gradient will be uniform at 10.5 percent, the sideslopes will be at 4h:1v, and the bottom width will be 10 feet. For any section of the channel not resting on bedrock, the fill will be riprapped to protect against erosion (page 29, PAP).

The access road leading to the site will be reclaimed and waterbarred to prevent erosion. Two culverts will be removed during the reclamation of the road. A 48-inch culvert located at the crossing of the ephemeral channel (see Plate V) will be removed and a channel excavated to allow fording of the creek. This channel is expected to rest on bedrock. The gradient of this channel will be the same as the culvert (0.071 ft./ft.) (page 51, PAP).

As the road and A-seam pad are regraded, an 18-inch culvert will be removed. With the filling in of the roadside ditch, the normal drainage to the 18-inch culvert will be diverted.

With the re-establishment of the ephemeral channel, regrading of the access road and the A-seam pad, the area draining to the sediment pond will be quite small, less than one acre. The sediment pond will be removed and the area draining the A-seam pad will be allowed to flow through the pond area into Ivie Creek after the discharge structures associated with the pond are removed. This drainage will be passed via triangular ditch through a silt fence (page 33, PAP).

Compliance

The applicant has demonstrated compliance with this section through the appropriate design calculations for channel restoration and through the use of sediment control, consisting of berms and silt fences along the edge of the regraded slopes and the ephemeral channel. The combination of channel, bed, and bank and flood plain configurations

are adequate to pass safely the peak runoff of 100-year, 24-hour precipitation event for all restored channels. All restored channels have been designed to prevent additional contributions of suspended solids to streamflow or runoff outside the permit area. Any runoff leaving the permit area will not be in excess of State or Federal standards.

Stipulations

None.

UMC 817.46-47 Hydrologic Balance: Sediment Ponds (TM)

Applicant's Proposal

The applicant has proposed to remove the existing decant structures from the sediment pond and breach the embankment to form a channel to Ivie Creek. Due to the layout of the site, very little drainage area, less than 1 acre, will contribute to the pond, following backfilling and grading of the site. Due to the arid climate and the lack of significant runoff, the applicant proposes to use alternative sediment controls (i.e., berms and silt fences) to control sediment from leaving the site.

Compliance

Based on past observation of the runoff characteristics of the site and the final site configuration, removal of the sediment pond is appropriate. No runoff will leave the disturbed area without prior treatment to prevent additional contributions of suspended sediments from entering the surface waters of Ivie Creek.

Considering the small drainage area and the runoff characteristics of the final site configuration, the sediment control plan during the reclamation phase is considered complete and adequate to meet the requirements of this regulation.

Stipulation

None.

UMC 817.49 Permanent and Temporary Impoundments (TM)

Applicant's Proposal

No temporary or permanent impoundments will be left on site. The current sediment pond will be breached and rendered ineffective.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring (TM)

Applicant's Proposal

Surface flow to Ivie Creek, a perennial stream, will be sampled and measured semi-annually, during the months of May and September. No groundwater sampling is planned since there was virtually no underground development and no mine water discharge. Water quality will also be sampled at discharge points (i.e., outlets to all restored channels) from the reclaimed area when flow is observed and at the two established monitoring points on Ivie Creek (page 62a, PAP).

Compliance

The applicant complies with the requirements of this section and the Division's water monitoring guidelines.

Stipulations

None.

UMC 817.53 Transfer of Wells (TM)

Applicant's Proposal

The applicant proposes to maintain the current drill holes 1, 2, 3 and 7 in their current condition. Drill hole #4 was not found. Drill hole #6 was found to be cemented to the surface with a survey marker installed in the plug. Drill hole #5 will be plugged with a five-foot surface plug during reclamation work to be conducted during the fall of 1986. Water rights for drill hole 1, 2, 3 and 7 are in place until January 31, 1988.

Compliance

The applicant is in compliance with this section until such time that these wells are transferred, then the applicant must meet the requirements spelled out under UMC 817.13 through 817.15.

Stipulations

None.

UMC 817.55 Hydrologic Balance: Discharge of Water into an Underground Mine (TM)

Applicant's Proposal

The applicant will fill and close all exploration adits at the underground mine during reclamation (see 817.13-15).

Compliance

Since all underground openings will be sealed, no runoff will enter or leave these openings; therefore the applicant is in compliance with this section.

Stipulations

None.

UMC 817.56 Hydrologic Balance: Post Mining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments, and Treatment Facilities (TM)

Applicant's Proposal

The applicant will re-establish natural conveyance of surface waters through the permit area. The sediment pond will be breached during reclamation and therefore will not be considered an impoundment (page 63, PAP).

Compliance

The applicant meets the requirements of this section.

Stipulations

None.

UMC 817.57 Stream Buffer Zone (TM)

Applicant's Proposal

Reclamation activities which will occur in the buffer zone are limited to removal of culverts that empty into the creek and the restoration of ephemeral channels which flow into Ivie Creek. Silt fences will aid in controlling sediments in these sensitive areas.

Compliance

Since the applicant will be restoring drainage through the disturbed area to Ivie Creek based on the requirements of UMC 817.43 and UMC 817.44, and water quality and quantity will not be adversely affected, then the applicant is in compliance with this section.

Stipulations

None.

UMC 817.71-74 Disposal of Underground Development Waste and Excess Spoil and Non-Acid and Non-Toxic Coal Forming Coal Processing (PGL)

This section is not applicable as there was never any underground development waste generated at this site.

UMC 817.81-88 Coal Processing Waste Banks (PGL)

This section is not applicable, as there was never any coal processing waste generated at this site.

UMC 817.89 Disposal of Non-Coal Wastes (PGL)

Applicant's Proposal

The applicant describes how non-coal wastes will be handled during reclamation on page 50a. A waste bin will be located onsite for the disposal of solid and liquid wastes. The non-coal waste will be hauled off-site to an approved landfill for disposal.

Compliance

The applicant will dispose of non-coal wastes in an acceptable manner. The applicant complies with this section.

Stipulations

None.

UMC 817.91-93 Coal Processing Waste: Dams and Embankments (PGL)

This section is not applicable as there was never any coal processing waste generated at this site.

UMC 817.95 Air Resources Protection (PGL)

Applicant's Proposal

The applicant describes fugitive dust emissions control during reclamation operations in Appendix i, page 7, (Air Pollution Control Plan) and on page 17a. This is a remote, protected canyon. During periods of winds in excess of 50 mph, reclamation work will be delayed until winds abate.

Compliance

The applicant has committed to appropriate fugitive dust control measures during reclamation. The applicant complies with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values (KMM)

Existing Environment and the Applicant's Proposal

The resident wildlife population consists of small mammals, birds and reptiles and their predators. An active prairie falcon nest across Ivie Creek from the mine site represents the only sensitive species known in the area. An owl which nested in the vicinity of the adits could not be relocated.

Compliance

Since the site is being reclaimed, negative impacts on wildlife should be minimal. Revegetation of the unproductive site will enhance wildlife habitat, providing additional food and cover. Reclamation is scheduled for autumn and should not adversely impact the spring nesting falcon. Development of water sources for wildlife enhancement is not appropriate at this site since the mine is adjacent to a perennial creek which will not be impacted by the reclamation activities. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage

Applicant's Proposal

The applicant has committed to mitigate any slide damage on the permit area during the bond liability period (addendum page 7, PAP).

Compliance

Applicant complies with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading: General (PGL)

Applicant's Proposal

The exposed coal seams will be graded to a slope of approximately 2h:1v. Slopes will be covered with 2" of topsoil. Backfill volumes will be about 11,000 cubic yards (page 18, PAP).

Compliance

A minimum static factor of safety of 1.35 was demonstrated for the backfilled highwalls (Appendix VII-Slope Stability Analysis, PAP). The applicant, however, did not specifically detail recontouring of the sediment pond. The applicant will comply when the following stipulation is met.

Stipulation 817.101-(1)-PGL

The sideslopes of the sediment pond shall be reduced to at least a 3h:1v slope during final reclamation and recontouring of the pond area.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid-Forming and Toxic-Forming Materials (PGL/DD)

Applicant's Proposal

The applicant will cover the exposed A and B seams to a slope of approximately 2h:1v (page 18). The slopes will then be covered with approximately 2 inches of topsoil and revegetated.

If any coal or acid- or toxic-forming materials are discovered during excavation and backfilling, they will be placed against the coal seams and covered with non-toxic materials (page 27).

The only material on-site which could be considered acid-forming or toxic is the coal. Tests on the coal quality (Appendix VI of the MRP) shows one sample has a total sulphur content of 3.94 percent, with no carbonates. Two other samples had contents of .4 and 1.19 percent. Ec of the coal was 6.1, 8.2 and 10.9 with SAR of 45.6, 6.2 and 4.8. Selenium and Boron are low for all samples. Although the coal materials may be considered acid-forming and saline, these materials are not readily evident on the site. The applicant commits to placing any material that may be toxic or acid-forming, that may be exposed during excavation, against the coal seam and backfilled with non-toxic materials (page 27, MRP).

Compliance

The only evident coal on the site is the exposted coal outcrop. The outcrop will be backfilled with non-toxic material. Since any potential acid-forming or toxic material that is exposed during excavation will be placed against the highwall and backfilled with non-toxic material, the applicant is in compliance with this section.

Stipulations

None.

UMC 817.106 Regrading or Stabilizing Rills and Gullies (PGL)

Applicant's Proposal

The applicant committed to repair rills and gullies throughout the bond liability period on page 27 of the PAP.

If there are persistent rill and gully sites, they will be stabilized with small gabions or rock-check dams (page 27, PAP).

Compliance

Applicant complies with this section.

Stipulations

None.

UMC 817.111 Revegetation: General (KMM)

See specific sections.

UMC 817.112 Use of Introduced Species (KMM)

Existing Environment and Applicant's Proposal

The revegetation seed mix contains seven native and three introduced species (i.e., Yellow sweetclover, Russian wildrye and Crested wheatgrass; p. 58-59).

Compliance

Yellow sweetclover is used for its nitrogen fixing value and should also serve as a nurse crop for the slow growing natives. Small amounts (one pound each) of Russian wildrye and Crested wheatgrass are included to assist in erosion control while the natives are becoming established. Nearby test plots have demonstrated that they are adapted to the area. They will provide food and cover for small animals and add diversity to the vegetation community until local natives invade. Since they are already established on site from old stabilization seedings and are being planted in small quantities, they should not be overly competitive. They are not considered poisonous or noxious. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing (KMM)

Existing Environment and Applicant's Proposal

The applicant proposes to seed in late fall (p. 59).

Compliance

Late fall is the appropriate time to seed in this locality. The proposal is in compliance with this section.

Stipulations

None.

UMC 817.114 Revegetation: Mulching (KMM)

Existing Environment and Applicant's Proposal

The applicant proposes to mulch with 4000 lbs. of alfalfa anchored with soil dragged over the hay or secured on steep slopes with erosion control netting (p.59).

Compliance

If covered in place, the alfalfa hay should be an important addition to the substitute soil of the reclamation project. The applicant will be in compliance with this section if the alfalfa can be adequately secured with a covering of dirt. Where the alfalfa cannot be secured in that manner, it will be secured with netting (e.g., on steep slopes).

Stipulations

None.

UMC 817.115 Revegetation: Grazing (KMM)

Existing Environment and Applicant's Proposal

Livestock grazing is limited in the area and will be limited further by fences on the access road and Ivie Creek (p. 56, 59 and Plate III). While these fences will not restrict wildlife or significantly reduce grazing, they will prevent livestock trampling damage on the revegetation area.

Compliance

There are currently no plans for permitting grazing during the last years of the bonding period. This will not represent any major difference between management of the mine site and adjacent areas, and will be in concert with the proposed post mining land use. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.116 Revegetation: Standards for Success (KMM)

Existing Environment and Applicant's Proposal

Revegetation success will be based on comparison of the mine area to a reference area established in the "Steep rocky slope" vegetation type. Qualitative monitoring will be done

monthly for the first two years and annually thereafter. Line intercept transects will be used in year three to check vegetation progress to determine the need for reseeding. The area will be quantitatively sampled for cover, density and productivity in years nine and ten of the bond period (p. 60-61).

Compliance

The applicant has chosen a reasonable reference area and sampling techniques for comparison with revegetated areas. Monitoring should be adequate to determine problem areas and initiate remedial action. Cover, density, and productivity will be sampled to determine success of revegetation because post mining land uses include grazing and wildlife habitat. The extended liability period will be for 10 years after the last augmentation of revegetation since the mine site receives less than 26 inches of precipitation. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.132 Cessation of Operations: Permanent (PGL)

There was no underground mining at this mine. Development ceased in August, 1980.

UMC 817.133 Postmining Land Use (KMM)

Existing Environment and Applicant's Proposal

Cattle grazing and wildlife habitat are the main land uses adjacent to the mine area. Cattle grazing is limited to 1 AUM per 10 acres. Both uses are proposed as post mining land uses although cattle grazing is likely to be only an occasional use especially in the relatively steep disturbed area. The primary purpose of revegetation will be to stabilize the site.

Compliance

The post mining land use is comparable to pre-mining uses and is compatible with other uses in the area. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-156 Roads: Class I (PGL)

Applicant's Proposal

The Class I haul road was constructed with public funds and is dedicated to Sevier and Emery counties (the ROW documents are found in Appendix I).

Compliance

The proper documents for transfer, ownership and maintenance of the public road are contained in the PAP. Applicant complies with this section.

Stipulations

None.

UMC 817.160-166 Roads: Class II (PGL)

Applicant's Proposal

The applicant's as-built road alignment is shown in Figure 6.1: Appendix D. The applicant addresses closing the road, drainage patterns being restored, and roadbeds being ripped, scarified and revegetated. A "road closed" sign will be placed at the terminus of the paved road. A 3-wire, 42-inch high barbed wire fence tied to the ledges across the upper portion of the road to prevent access will be constructed.

This fence will be checked during each site visit and maintained as required to retain the integrity of the fence. The 48-inch and two 18-inch diameter culverts will be removed and the natural ephemeral drainage restored and stabilized. Eleven water bars will be spaced according to Table 3b and located on the ripped roadbed according to Plate III. Existing soil material will be used as the growing medium with properly prepared mulching and fertilizing practices. The roadbed will be ripped and scarified prior to revegetation.

Compliance

The roadbed will be ripped and scarified and the fence and gate will prevent access to the property. The restoration of the road meets the reclamation standards of UMC 817.166. Applicant complies with this section.

Stipulations

None.

UMC 817.170-176 Roads: Class III (PGL)

There are no Class III roads on the site, therefore this section is not applicable.

UMC 817.180-181 Transportation Facilities and Other Support Facilities and Utility Installations (PGL)

There were no facilities constructed, therefore, this section is not applicable.

HIDDEN VALLEY
RECLAMATION COST ESTIMATE
November 19, 1986

		Unit Cost	Total Cost
1.	Hauling roadbase 1800 cu yds, 25 hrs.	$ 2.30	$ 4,140
	spreading topsoil 770 cu yds, 11 hrs.	$ 1.61	$ 1,240
	Sub total		$ 5,380
2.	Removing culverts, 89 hrs.		
	road 80' of 48", 213 cu yds excavation	$ 1.36	$ 290
	60' of 18", 20 cu yds excavation	$ 3.85	$ 77
	pads 250' of 48", 10,924 cu yds excavation	$ 1.36	$ 14,857
	230' of 18", 501 cu yds excavation	$ 3.85	$ 1,945
	seed pond 40' of 18", 178 cu yds excavation	$ 3.32	$ 591
	remove pipe and concrete pads		$ 200
	sampling for particle analysis		$ 250
	Sub total		$ 18,210
3.	Covering coal seams and grading, 179 hrs.		
	Collapse structures in 4 adits		$ 480
	Fill 4 adits 296 cu yds	$ 3.39	$ 1,003
	"A" seam cover 2500 cu yds	$ 3.39	$ 8,475
	"B" seam cover 10250 cu yds	$ 3.39	$ 34,748
	Slope grading 1800 cu yds	$ 3.39	$ 6,102
	General grading 500 cu yds	$ 3.39	$ 1,695
	Sub total		$ 52,503
4.	Riprap channels, 44 hrs.		
	80' in road 67 cu yds	$ 21.13	$ 1,416
	250' in pad 930 cu yds	$ 21.00	$ 19,350
	100' in A Pad 15 cu yds	$ 21.00	$ 315
	Hauling rock all sites	$ 1.78	$ 2,422
	Sub total		$ 23,503

		Unit Cost	Total Cost
5.	Waterbars in road and ripping, 10 hrs.		
	11 waterbars	$	$ 65[illegible]
	rip, 2.4 acres	$ 314.58	$ 75[illegible]
	Sub total		$ 1,40[illegible]
6.	Seedbed preparation and seeding, 50 hrs.		
	benches, 4.2 acres	$ 1,800	$ 7,56[illegible]
	road and roadbase site, 2.5 acres	$ 1,800	$ 4,50[illegible]
	Sub total		$ 12,06[illegible]
7.	Fences, gates and erosion netting, 55 hrs.		
	fences, 180'	$ 4.60	$ 84[illegible]
	gate, 1 ea.		$ 20[illegible]
	silt fences, 700'	$ 5.85	$ 4,09[illegible]
	erosion netting, 2250 sy	$ 0.55	$ 1,23[illegible]
	Sub total		$ 6,37[illegible]
8.	Drill Hole plugging, 2 holes (dry)	$ 500	$ 1,00[illegible]
	Sub total		$ 1,00[illegible]
9.	Miscellaneous, 64 hrs.		
	Equipment mobilization		$ 5,00[illegible]
	Equipment rental		$ 2,50[illegible]
	Materials disposal		$ 2,50[illegible]
	Sub total		$ 10,00[illegible]
	Reclamation Total		$130,43[illegible]
10.	Monitoring, 10 years		
	Water sampling, 20 trips		$ 16,00[illegible]
	Revegetation checks, 20		$ 7,00[illegible]
	Total		$ 23,00[illegible]

10.	Contingency 10%	$ 15,344
	Escalation 1.62% for 1 yr. (1987 dollars)	$ 2,734
	Sub total	$ 18,078
	Grand Total	$171,515

(1987 dollars)

Means Site Work Cost Data, 1986, 5th Edition
Hours represent total equipment time.

0920R/22